

NC7S86P5X-TP

2-INPUT EXCLUSIVE-OR GATE

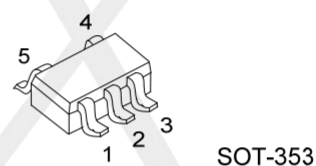
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DESCRIPTION

The **NC7S86P5X-TP** is a 2-input EXCLUSIVE-OR gate, it provides the Function $Y=A \oplus B$.

FEATURES

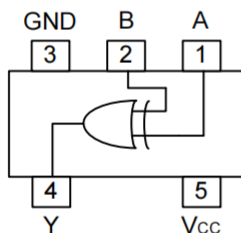
- * Operation voltage range: 2 ~ 5.5V
- * Low power current: $I_{CC}=10\text{Ma}$ (Max)
- * High speed: $t_{PD}=4.3\text{ns}$ (Typ)



ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
NC7S86P5X-TP	NC7S86P5X-TP	SOT-353	Tape Reel

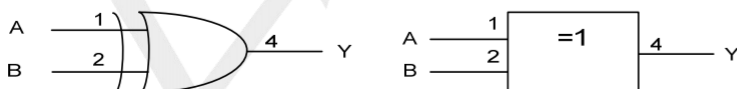
PIN CONFIGURATION



FUNCTION TABLE (Each Gate)

INPUT		OUTPUT
A	B	Y
L	L	L
L	H	H
H	L	H
H	H	L

LOGIC DIAGRAM (Positive Logic)



■ ABSOLUTE MAXIMUM RATINGS (Unless otherwise specified) (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5~7	V
Input Voltage	V_{IN}	-0.5~7	V
Output Voltage	V_{OUT}	-0.5~ $V_{CC}+0.5$	V
Input Clamp Current	I_{IK}	-20	mA
Output Clamp Current	I_{OK}	±20	mA
Output Current	I_{OUT}	±25	mA
V_{CC} or GND Current	I_{CC}	±50	mA
Storage Temperature	T_{STG}	-65 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

■ THERMAL DATA

PARAMETER	SYMBOL	RATING	UNIT
Junction to Ambient	θ_{JA}	350	°C/W

■ RECOMMENDED OPERATING CONDITIONS (Unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2		5.5	V
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t/\Delta v$	$V_{CC}=3.3+0.3V$			100	ns/V
		$V_{CC}=5.0+0.5V$			20	
Operating Temperature	T_A		-40		+125	°C

■ STATIC CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	V_{IH}	$V_{CC}=2.0V$	1.5			V
		$V_{CC}=3.0V$	2.1			
		$V_{CC}=5.5V$	3.85			
Low-Level Input Voltage	V_{IL}	$V_{CC}=2.0V$			0.5	V
		$V_{CC}=3.0V$			0.9	
		$V_{CC}=5.5V$			1.65	
High-Level Output Voltage	V_{OH}	$V_{CC}=2.0V, I_{OH}=-50\mu A$	1.9	2.0		V
		$V_{CC}=3.0V, I_{OH}=-50\mu A$	2.9	3.0		
		$V_{CC}=4.5V, I_{OH}=-50\mu A$	4.4	4.5		
		$V_{CC}=3.0V, I_{OH}=-4mA$	2.58			
		$V_{CC}=4.5V, I_{OH}=-8mA$	3.94			
Low-Level Output Voltage	V_{OL}	$V_{CC}=2.0V, I_{OL}=50\mu A$			0.1	V
		$V_{CC}=3.0V, I_{OL}=50\mu A$			0.1	
		$V_{CC}=4.5V, I_{OL}=50\mu A$			0.1	
		$V_{CC}=3.0V, I_{OL}=4mA$			0.36	
		$V_{CC}=4.5V, I_{OL}=8mA$			0.36	
Input Leakage Current	$I_{(LEAK)}$	$V_{CC}=0 \sim 5.5V, V_{IN}=V_{CC}$ or GND			±0.1	μA
Quiescent Supply Current	I_Q	$V_{CC}=5.5V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			1	μA
Input Capacitance	C_{IN}	$V_{CC}=5.0V, V_{IN}=V_{CC}$ or GND		4	10	pF

■ **DYNAMIC CHARACTERISTICS** (Input: $t_R, t_F \leq 3\text{ns}$; $\text{PRR} \leq 1\text{MHz}$, unless otherwise specified)

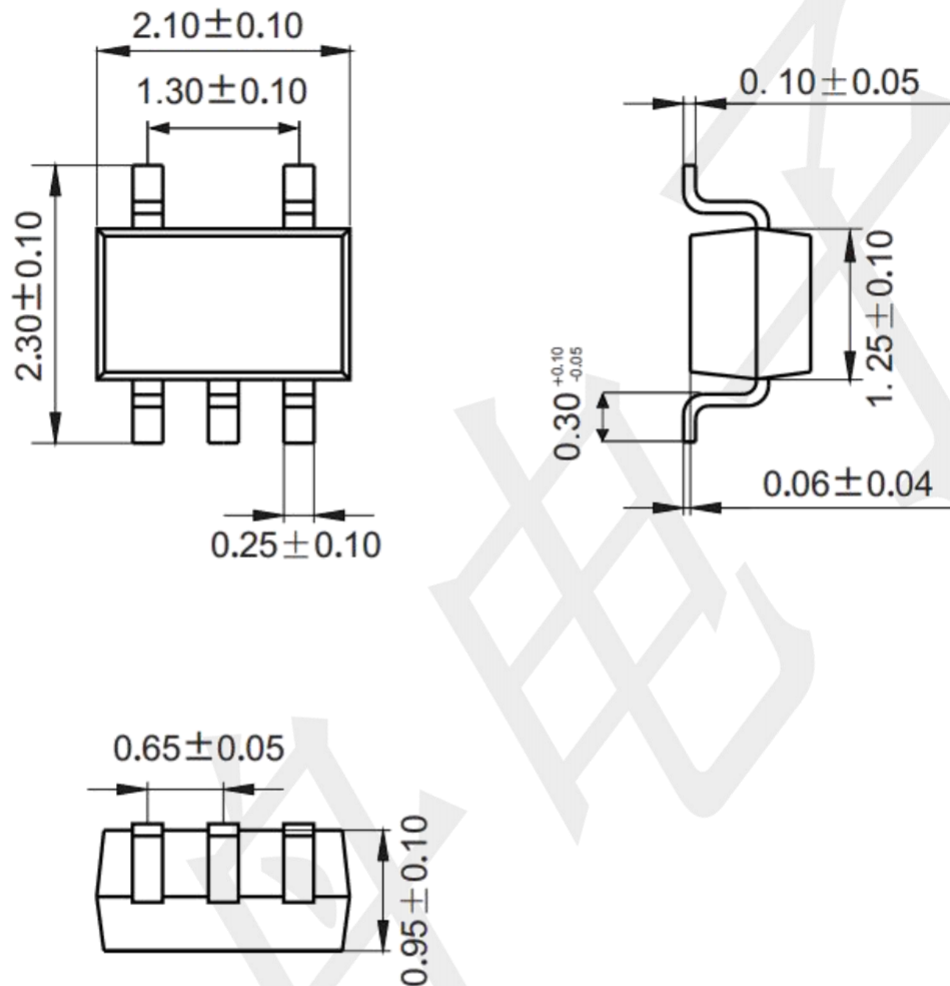
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (A and B) to output(Y)	t_{PLH}	$V_{CC} = 3.3V \pm 0.3V, C_L = 15\text{pF}$		7	11	ns
	t_{PHL}			7	11	
	t_{PLH}	$V_{CC} = 3.3V \pm 0.3V, C_L = 50\text{pF}$		9.5	14.5	
	t_{PHL}			9.5	14.5	
Propagation delay from input (A and B) to output(Y)	t_{PLH}	$V_{CC} = 5V \pm 0.5V, C_L = 15\text{pF}$		4.8	6.8	ns
	t_{PHL}			4.8	6.8	
	t_{PLH}	$V_{CC} = 5V \pm 0.5V, C_L = 50\text{pF}$		6.3	8.8	
	t_{PHL}			6.3	8.8	

■ **OPERATING CHARACTERISTICS** (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	No load, $f = 1\text{MHz}$, $V_{CC} = 5V$		18		pF

Package information (Unit: mm)

SOT353



Mounting Pad Layout (Unit: mm)

